Comparison of the Differences and Usage of Trees between the Old Public Housing estate and the New Public Housing estate

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1. Abstract

Trees in Hong Kong's public housing estates are a vital component of urban green infrastructure, playing crucial roles in providing ecological services, enhancing community well-being, and contributing to residents' sense of happiness. This project, titled Comparing the Difference and Usage of Trees between Old Public Housing Estates and New Public Housing Estates, investigates how tree planting and usage differ across generations of public housing in Hong Kong. Hong Kong hosts numerous public housing estates where many citizens live in a unique built environment closely intertwined with urban trees.

This study systematically reviews relevant research findings, comparing the differences and usage of trees between old and new estates from three dimensions: planting environment and tree structure, species diversity, and the social functions of trees. Additionally, this project will examine the habitats of trees, their functional uses, including shade provision, ornamental value, and social space support. Data are collected

through field tree surveys and systematic recording of tree conditions and spatial distribution, followed by analysis to reveal patterns in native species proportion, greening rate, and landscape design priorities. Expected outcomes include a higher proportion of native species and a greater emphasis on ornamentals in new estates, while older estates are anticipated to focus more on basic shade provision with less attention to tree health, despite similar overall greening rates.

2. Introduction

Hong Kong is the place of many public housing estates; many citizens live in this special living environment. Moreover, many trees planted in our living area have led to a close relationship between humans and trees. As for March 2026, Hong Kong had 266 public housing estates, with a total of over 850,000 residences. Over 102,000 trees growing in about 200 public rental housing estates and venues are managed under the Hong Kong Housing Authority (HA). Introduction. In high-density urban environments, green spaces in public housing represent a vital interface through which residents engage with nature. In Hong Kong, approximately 45% of the population resides in public housing estates. However, the construction of Hong Kong's public housing estates spans several decades—from the early resettlement areas of the 1950s to the new town development projects of the 21st century. Significant differences exist in planning philosophies, spatial constraints, and greening policies across these periods, resulting in distinct characteristics and challenges for trees in old versus new estates.

Trees play a very important role in the city. They provide environmental, social, and economic benefits that make urban life better. Trees help improve air quality by absorbing polluting gases and trapping dust and smoke on their leaves and barking. They can cool cities by shading surfaces and through evapotranspiration, which lowers city temperatures

and helps reduce the urban heat island effect. Trees may also have social and health roles. Access to trees and green spaces is linked to less stress, better mood, and improved mental health for people. Some studies suggest that trees provide comfortable outdoor spaces by giving shade and reducing glare, which encourages walking, social interaction, and outdoor activities.

This study compares the differences and usage of trees between old and new public housing estates in Hong Kong, focusing on how tree provision reflects evolving planning priorities. In this project, 6 public housing estates are selected for investigation. It includes Po Lam Estate, Hau Tak Estate, Sheung Tak Estate, Tung Wui Estate, Yee Ming Estate, and Kin Ming Estate. Po Lam Estate, Hau Tak Estate, and Sheung Tak Estate were built before the 2000s. Tung Wui Estate, Kin Ming Estate, and Yee Ming Estate were built after 2000. The definition of old and new public housing estates is based on the time of construction completed before and after the 2000s.

3. Literature Review

Comparison of Differences and Usage of Trees between Old and New Public Housing Estates in Hong Kong

Background

In high-density urban environments, green spaces in public housing represent a vital interface through which residents engage with nature. In Hong Kong, approximately 45% of the population resides in public housing estates. Trees within these estates not only provide ecological services such as shade, cooling, and air purification but also fulfill social functions related to community identity and psychological well-being. However, the construction of Hong Kong's public housing estates spans several decades—from the early resettlement areas of the 1950s to the new town development projects of the 21st century. Significant differences exist in planning philosophies, spatial constraints, and greening policies across these periods, resulting in distinct characteristics and challenges for trees in old versus new estates.

Differences in Planting Environment and Tree Structure

The most fundamental differences between trees in old and new estates derive from the physical conditions of their planting environments. (Zhang et al., 2020) categorized planting environments in estates into "good, "general," and "constrained" types, based on criteria such as growing space, soil quality, surrounding pavement conditions, and pedestrian traffic volume. The study found that old estates had significantly more constrained planting environments compared to new estates—trees were planted in small tree pits surrounded by concrete, severely limiting root growth.

This environmental disparity directly affects tree structural integrity and wind resistance. A large-scale study covering 102 public housing estates and 38,156 trees employed methods such as Canonical Correspondence Analysis (CCA) and Redundancy Analysis (RDA) to systematically assess the relationship between tree structure and planting environment. Results showed that the health conditions of two common tree species in old estates—Taiwan acacia *(Acacia confusa)* and Chinese banyan *(Ficus microcarpa)*—were significantly influenced by inadequate planting environments. The former was often planted on slopes with insufficient soil depth, while the latter frequently appeared in roadside planters surrounded by concrete. These "species-site" mismatches caused trees to be prone to uprooting or trunk breakage during typhoons.

In contrast, new estates benefit from more generous green spaces and more systematic landscape design during planning. Since the early 2000s, the Hong Kong Housing Authority has implemented increasingly explicit greening policies, such as raising the tree-to-unit ratio to 6.8 trees per 15 units in new estates. Planting space design in new estates also places greater emphasis on soil volume and drainage conditions, reducing the prevalence of "concrete tree pits." However, studies have also noted that even in new estates, some large tree species continue to be planted in spaces with insufficient room for growth, indicating that awareness of species-site matching still requires improvement.

Conclusion

Comparative research on trees in Hong Kong's public housing estates reveals a fundamental transformation: from "gap-filling greenery" oriented toward functional greening, to "people-tree symbiosis" designed for well-being. The constrained planting environments and structural defects faced by trees in old estates are legacies of the planning limitations of their era. While new estates have improved planting conditions, opportunities for

enhancement remain in biodiversity and community engagement. Recent policy innovations have redefined trees as partners in community building rather than mere objects of management. This perspective shift offers valuable lessons for public housing greening management in high-density cities globally. The future challenge lies in respecting the value of aging trees while addressing safety concerns with scientific approaches, ultimately achieving sustainable coexistence between people and trees in the urban environment.

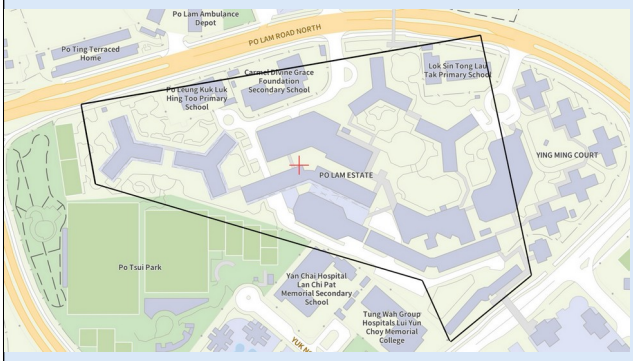
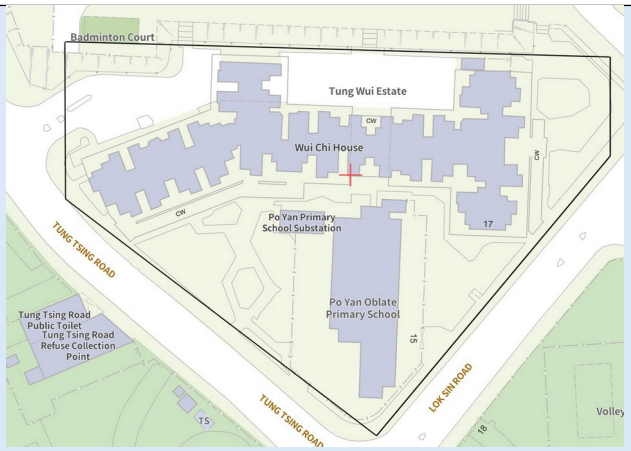
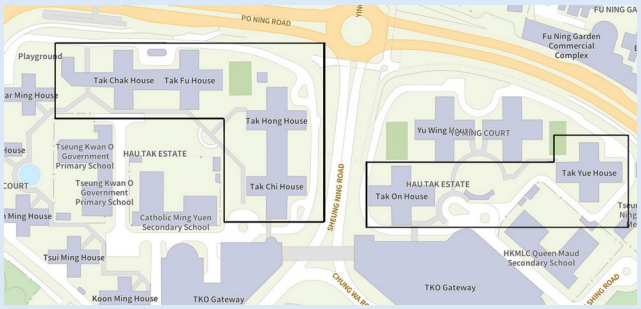
4. Project Objectives

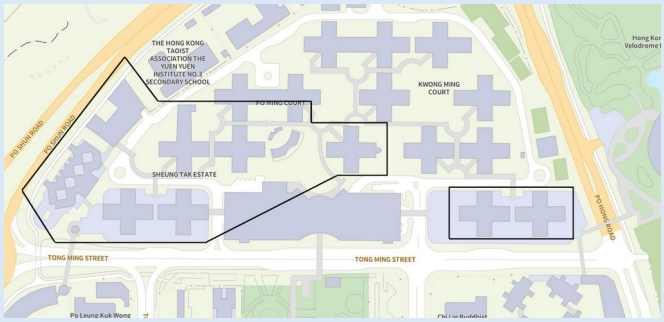
The aims of this project are to investigate the differences and the usage of trees in the Old and New Public Housing Estates. Over time, people's views on trees have changed. For example, citizens' awareness of the value of trees has increased. In the past, people did not pay much attention to trees, so there were no policies implemented regarding trees and the environment. With increased knowledge and understanding, both the government and citizens have paid more attention to and valued trees. Policies and guidelines are also constantly being updated. Therefore, surveying trees in urban areas is crucial for a better understanding of the needs of modern people for trees and for informing future tree planting plans.

5. Project Scope

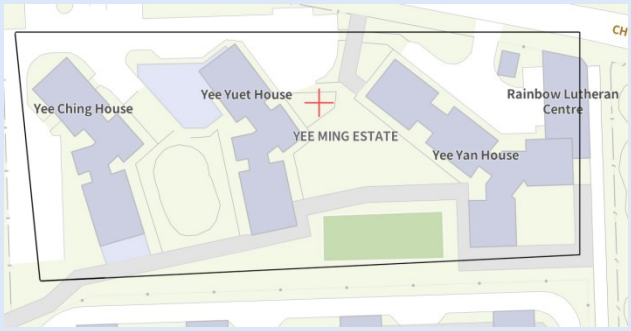
In this project, the location site does not include all shopping malls, schools, or the slope. When the tree is in the boundary of the estate or does not comply with a standard about the tree (Below 1.5m and DBH lower than 95mm) do not record them.

(Figure 5) Map of the Project Site

Old Public Housing Estate (Before 2000s)	New Public Housing Estate (After 2000s)
 □Subfigure5.1) Po Lam Estate	 □Subfigure5.4) Tung Wui Estate
 □Subfigure5.2) Hau Tak Estate	 □Subfigure5.5) Kin Ming Estate


THE HONG KONG TAOIST ASSOCIATION THE YUEN YUEN INSTITUTE NO.3 SECONDARY SCHOOL
KWONG MING COURT
PO MING COURT
PO SHUN ROAD
PO CHING ROAD
SHEUNG TAK ESTATE
TONG MING STREET
TONG MING STREET
PO HONG ROAD

Subfigure5.3Sheung Tak Estate



Subfigure5.6) Yee Ming Estate

Project site 1: Po Lam Estate (Subfigure 5.1)

The residential buildings of Po Lam Estate were completed in 1988, so it generalizes to Old Public Housing Estate. According to the Population Census (2021), the Estate Population is 13,856 people. The median age of this estate is 53 years old. The median monthly household income of Po Lam Estate is almost $20,810.

Project site 2: Hau Tak Estate (Subfigure 5.2)

Hau Tak Estate is also the target of the Old Public Housing Estate since the Construction was completed in 1993. According to the Population Census (2021), the Estate Population is 12,491 people. The median age of this estate is 48 years old. The median monthly household income of Hau Tak Estate is almost $36,000.

Project site 3: Sheung Tak Estate (Subfigure 5.3)

Sheung Tak Estate construction was completed in 1998; it is the last target estate of the Old Public Housing Estate. According to the Population Census (2021), the Estate Population is 16,932 people. The median age of this estate is 46.3 years old. The median monthly household income of

Sheung Tak Estate is almost $27,140.

Project site 4: Tung Wui Estate (Subfigure 5.4)

About the Tung Wui Estate, the year of Completion in 2012, it was built after the 2000s; it generalizes New Public Housing Estate. According to the Population Census (2021), the Estate Population is 5,280 people. The median age of this estate is 62.8 years old. The median monthly household income of Tung Wui Estate is almost $13,140.

Project site 5: Kin Ming Estate (Subfigure 5.5)

Kin Ming Estate was built in 2003, it was built after 2000s, it generalizes New Public Housing Estate. According to the Population Census (2021), the Estate Population is 19,190 people. The median age of this estate is 59.6 years old. The median monthly household income of Kin Ming Estate is almost $21,720.

Project site 6: Yee Ming Estate (Subfigure 5.6)

Yee Ming Estate construction was completed in 2014; it is the last target estate of the New Public Housing Estate. According to the Population Census (2021), the Estate Population is 5,479 people. The median age of this estate is 52.2 years old. The median monthly household income of Yee Ming Estate is almost $17,860.

6. Methodology

【Table 6.1】Tree Survey Table (onsite visit】

Name of the estate】									
Tree No.	Scientific Name	Chinese Name	Tree Height (m)	DBH (mm)	Crown Diameter (m)	CBH (m)	Native (N) / Exotic (E)	Habitat (Tree Pit / Planter)	Health Condition (G/F/B)

The methodology for this project combines both quantitative and qualitative research. Tree surveys will be conducted on-site in three old and three new public housing estates; the definition of old and new public housing estates is based on the time of construction completed before and after the 2000s. It records data such as tree species, tree height, Diameter at Breast Height (DBH), tree crown diameter, local distribution status, habitat of the tree, and tree health condition in a tree survey. In addition to species identification, the study will measure canopy cover, greening rate, and spatial distribution to quantitatively compare the ecological characteristics of tree populations in each setting.

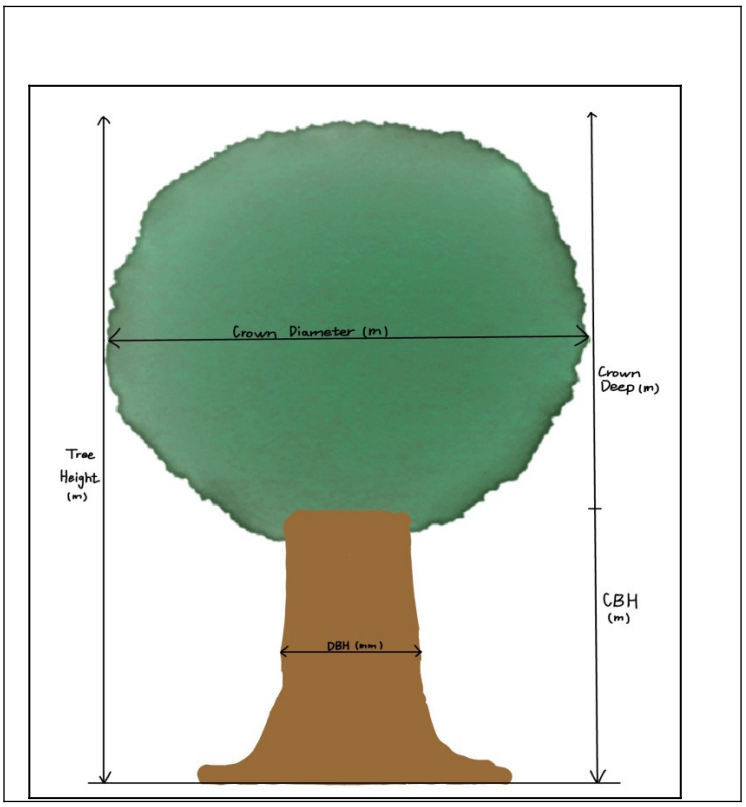


Figure 6.2) Tree Measuring

Diameter at breast height, or DBH, is a standard method of expressing the diameter of the trunk or bole of a standing tree. DBH is one of the most common dendrometric measurements. Electronic calipers can measure diameter at breast height and send measured data via Bluetooth to a field computer. Tree trunks are measured at the height of an adult's breast, which is defined differently in different countries and situations. In many countries, DBH is measured at approximately 1.3 m (4.3 ft) above ground. DBH is an abbreviation for Diameter at Breast Height. The diameter at breast height is a standard form of measuring the diameter of a tree. To measure a tree’s DBH, measure the tree’s circumference at breast height. The DBH is a standard unit of measurement in Arboriculture. DBH stands for Diameter at Breast Height.

The CBH (crown base height), also called height to crown base, CBH of a tree is the vertical distance from the ground to the base of the lowest

significant live branch or lowest hanging foliage on the tree's main stem. Collecting this data can help us calculate the live crown ratio of the tree and better understand the growth status of trees. About the variable of tree health condition, it will be divided into Good, Fair, and Bad conditions to record the tree growth status.

7. Timeline / Work Plan

Table7.1) Timeline

	Project Schedule																
Name of stage	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26	Jan-27	Feb-27	Mar-27	Apr-27	May-27
Design Project																	
Design Proposal																	
Planning Project																	
Tree Survey																	
Data analysis																	
Result Presentation																	

In this project, the arrangement will be divided into 3 different phases: project designing, proposal designing, and project planning. In phase 1, the expected completion time is within 5 months (January 2026 to May 2026). The tree survey will be scheduled in phase 2; the expected completion time is within 7 months (June 2026 to December 2026). The Data analysis and Result presentation will be conducted in phase 3; the expected completion time is also within 7 months (November 2027 to May

2027).

8. Expected Outcomes

For the expected outcomes, five expected results are listed. First is that the Native Tree species of the New Public Housing estate are more than those of the Old Public Housing estate. It is because the planting plan of the government compared before and after the 2000s has very different differences. Hong Kong's tree-planting program around the 2000s underwent a significant strategic shift from "rapid greening" to "ecological restoration." Behind this lies a profound reflection on the tree-planting philosophy of the past half-century. The first phase: "Large-scale rapid greening" at the turn of the century. This phase lasted from the mid-1990s to the early 2000s. Its core objective was to use rapidly growing exotic tree species to quickly cover barren hillsides and rapidly develop new towns with greenery, addressing soil erosion and aesthetic issues. The second phase: "Strategic shift and ecological optimization" in the mid-2000s. By the mid-2000s, the large number of exotic trees planted in the early stages began to show problems such as aging and over-density growth. People began to realize that forests of a single species had low ecological value and weak resistance to pests and diseases. The goal of tree planting shifted from increasing "quantity" to pursuing "quality."

Second is that the usage of trees is different in the Old and New Public Housing Estates. The main usage of the Old Public Housing estate is providing a shade area, so it plants many large trees, for example, the species of Ficus and Flame tree. On the other hand, New Public Housing estates mainly use trees to increase ornamental value in the living area, such as the Tree of Gold and the Hong Kong Orchid Tree.

Thirdly, the tree species diversity of the New Public Housing estate is more

than that of the Old Public Housing estate since the Hong Kong government changed the tree planting strategy, "Large-scale rapid greening" changes to "Strategic shift and ecological optimization". Its effect on tree species diversity was increased.

The habitat of trees in the Old Public Housing estate does not emphasize that tree conditions are one of the expected outcomes. Many Old Public Housing estates are using tree pits to plant trees; this is the reason a lot of trees occur in tree health problems.

The last expected outcome is that the rate of greening areas about Old Public Housing estate is equal to New Public Housing estate. Large trees can provide a large green area in the living area. However, large trees also require a lot of space to develop. Relatively, the New Public Housing estate plants more trees in the living area; it mostly uses medium size trees in the planting area, and it has enough space to plant more trees.

9. Conclusion

The comparison between trees in old and new public housing estates in Hong Kong reveals a fundamental shift in greening philosophy alongside persistent challenges. Old estates, constrained by early planning limitations, feature mature trees planted in inadequate spaces—shallow soil volumes and concrete-encased pits—resulting in species-site mismatches and higher structural defects. Despite these risks, their decades-old trees serve as irreplaceable anchors of community identity and collective memory.

New estates benefit from improved planning standards, larger planting spaces, and diverse species selection, reflecting a more professional approach. However, challenges such as floristic homogenization and residual species-site mismatches remain.

A notable evolution in usage patterns has emerged: trees are increasingly viewed not merely as aesthetic or risk-management assets but as active contributors to community well-being. Recent policy initiatives emphasize resident participation, environmental education, and the creation of social spaces around trees, marking a shift from "tree-centric" management toward "people-tree symbiosis."

Moving forward, old estates require renewal strategies that balance safety with cultural preservation, while new estates must prioritize biodiversity and ecological resilience. Ultimately, sustainable urban greening demands continuous learning from past limitations and meaningful resident engagement.

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